

Corporate Hedging, Investment, and Value

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Hedging

- ▶ Why do firms hedge? To overcome some friction.
- ▶ Reduce costs of financial distress: Smith and Stulz (1985), Stulz 1996.
- ▶ Increase debt capacity: Leland (1996)
Increases interest tax shields, so increases value.
- ▶ Reduce costs due to underinvestment: Froot, Scharfstein, and Stein (1993).
- ▶ Hedging increases access to foreign currency debt: Berrospide (2007).

Previous empirical work

- ▶ Hedging: often proxy by derivative usage (as we do).
- ▶ Noisy and mixed empirical findings:
 - ▶ Allayannis and Weston (2001): Derivative users have a value that is 5% higher than non-users.
 - ▶ Guay and Kothari (2003): Cash flows from derivatives are very small relative to overall cash flows.
 - ▶ Cannot explain differences in value.
 - ▶ Perhaps derivative usage a signal, or correlated with something else that is valuable (e.g. management skill).

This paper

- ▶ Consider firms in Brazil in period 1997–2004.
Examine effect of hedging on value.
- ▶ Advantages of set-up:
 - ▶ Identifiable source of risk: exchange rate fluctuations.
Restrict attention to firms that have dollar liabilities.
 - ▶ Exogenous shock: Brazilian currency crisis, 1998–99.
Disequilibrium situation while firms learn optimal policy in new regime.
 - ▶ Panel data: examine firms before and after they begin hedging.

Main Findings

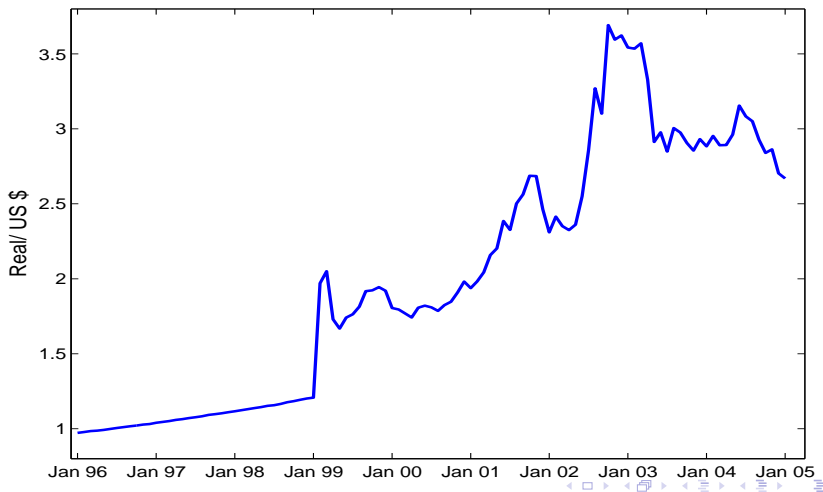
- ▶ Derivative usage associated with 7% higher market value.
- ▶ Two channels via which derivatives add value.
- ▶ First, alleviate underinvestment problem.
Hedged firms not dependent on internal funds for investment.
- ▶ Second, increase capacity to take on foreign currency debt.
 - ▶ Foreign debt cheaper than domestic debt.
 - ▶ Hedged firm increases foreign debt → lower cost of capital.

Brazil crisis

- ▶ Exchange rate until Jan '99 was “fixed” (managed float).
- ▶ Speculation in late '98 over feasibility of Brazil policy.
- ▶ Jan 15, 1999: Real floated, fell 66% in value in 2 weeks.
- ▶ Low GDP growth rates until 2004.
- ▶ Other crises in this period:
 - Jul 1997: Asia
 - Aug 1998: Russia

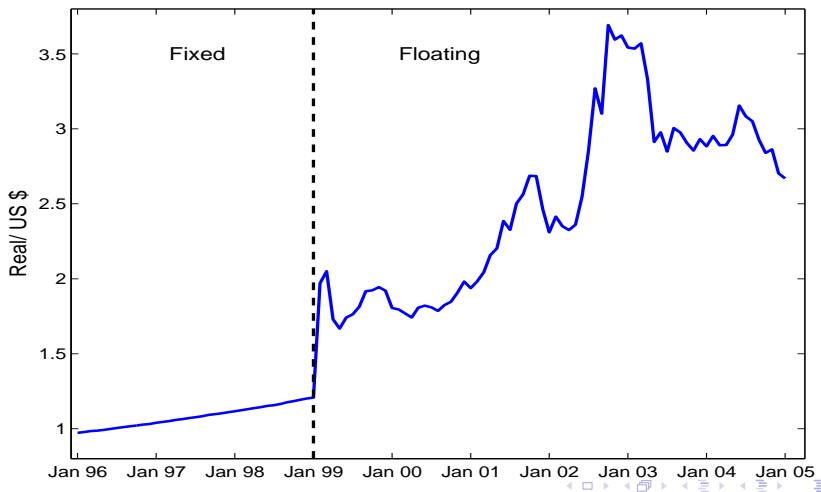
Brazil

Brazil exchange rate



Brazil

Brazil exchange rate



Data

- ▶ Annual data on Brazilian firms
- ▶ Two main data sources:
 - ▶ Financial statement information from Economatica.
 - ▶ Stock market values and derivatives data from footnotes to financial statements at Bovespa (São Paulo stock exchange).
- ▶ Set of firms = intersection of firms in both sources.
- ▶ 167 firms in all, 1,023 firm-year pairs: unbalanced panel.

First Look: Derivatives and Value

Dep. variable = Tobin's q (Mkt-to-Book).

Include Industry & Year dummies, cluster at firm level.

	OLS		Fixed Effect	
	Coeff	t-stat	Coeff	t-stat
Const	-0.8123	(-1.84)	0.3872	(0.72)
log(Sales)	0.0975	(2.95)	0.0012	(0.03)
Margin/TA	0.7864	(2.27)	1.6084	(4.41)
Sales Growth	0.0677	(0.90)	-0.0308	(-0.58)
Cap Exp/TA	0.7867	(1.18)	1.5414	(3.25)
Deriv Use	0.1655	(2.18)	0.0782	(2.00)
R^2	0.27		0.33	
N	909		909	

Derivatives and Capital Expenditure

Dep variable = Capital Expenditure / Total Assets

	Coeff	t-stat	Coeff	t-stat
Const	0.0372	(1.46)	0.0359	(1.45)
log(Sales)	0.0025	(1.37)	0.0021	(1.14)
Avg. Lev.	-0.0154	(-0.95)	-0.0127	(-0.79)
Margin/TA	0.0430	(2.33)		
Deriv Use	0.0132	(1.80)	0.0309	(2.45)
Deriv × Margin			-0.0093	(-0.27)
(1 - Deriv) × Margin			0.0626	(2.94)
R^2	0.18		0.18	
N	889		889	

Profitability and Derivatives

Dep variable = Net Income / Total Assets

	Coeff	t-stat	Coeff	t-stat
log(Sales)	0.0057	(1.81)	0.0048	(1.40)
Oper. Inc./TA	0.1837	(4.92)	0.1876	(5.02)
Inv. Inc./TA	1.4825	(6.07)	1.4882	(6.09)
Deprec./TA	-0.8168	(-3.42)	-0.8057	(-3.30)
Avg. Lev	-0.1201	(-4.47)		
Avg. Dom. Lev			-0.1400	(-4.04)
Avg. For Lev × Deriv			-0.0295	(-0.67)
Avg. For Lev × (1-Deriv)			-0.1208	(-2.86)
Deriv Use	0.0159	(1.97)	-0.0044	(-0.30)
R^2	0.35		0.33	
N	953		953	

Derivatives and Foreign Debt Mix

Dep variable = Foreign Currency Debt / Total Debt

	OLS		Firm Fixed Effects	
	Coeff	t-stat	Coeff	t-stat
Const	-0.3222	(-2.23)	0.0578	(0.22)
log(Sales)	0.0659	(5.92)	0.0350	(1.66)
Margin/TA	-0.2190	(-1.65)	-0.1640	(-1.06)
Export Dummy	0.0779	(2.00)	-0.0331	(-0.63)
Deriv Use	0.1816	(5.96)	0.0677	(2.59)
R^2	0.37		0.06	
N	992		992	

Endogeneity of Derivative Usage and Foreign Debt

- ▶ Derivative usage determined along with other financial (e.g. leverage) and operating (e.g. sales) variables.
- ▶ Consider simultaneous equation model.

- ▶ First stage:

$$\text{Deriv Use} = f(\text{Sales, Leverage, Leverage}^2, \text{Other Variables}).$$

- ▶ Second stage: Use fitted values of derivative usage in regression of Foreign/Total Debt on explanatory variables.

Instrumental Variable Regression

Dep variable = Foreign Currency Debt / Total Debt

	For. Debt/Total Debt		For. Debt/Total Assets	
	Coeff	t-stat	Coeff	t-stat
Const	0.2661	(1.10)	0.3528	(3.38)
log(Sales)	0.0372	(2.46)	-0.0050	(-0.76)
Margin/TA	-0.1904	(-1.99)	-0.1861	(-4.67)
Dollar Assets Dummy	0.1115	(4.13)	0.0742	(6.76)
Export Dummy	0.0628	(2.14)	0.0211	(1.93)
Other Controls	xxx		xxx	
Deriv Use	0.0580	(3.11)	0.0487	(5.96)
R^2	0.37		0.46	
N	947		978	

Conclusion

- ▶ Demonstrate value of hedging via currency derivatives to Brazilian firms following 1999 currency crisis.
- ▶ Hedging adds to firm value in two ways:
 - ▶ Increases capacity to take on foreign debt, which is cheaper than domestic debt (reduces cost of capital).
 - ▶ Allows greater capital expenditures, and investment independent of internally generated funds (increases growth rate of cash flows).
- ▶ Potentially important role for currency derivative markets in developing economies.